

REMARKS/ARGUMENTS

Reconsideration of this application and entry of this Amendment are solicited. Claims 1, 3, 13 and 14 will be active in the case subsequent to entry of this Amendment.

It is proposed to amend claim 1 in three aspects. First, the subject matter of claim 5 specifying that the olefin composite fiber is a sheath-core composite fiber containing polyethylene as a sheath portion as in original claim 5.

Considering the examiner's comments in the last three lines of page 4 of the Action, claim 1 is amended to state the decrease ratio of the amount of adhering oil must be at least 60% making this feature a positive requirement of the claim.

Claim 1 is also amended to define the oil as consisting of a specified ester of polyethylene glycol and fatty acid. This amendment is directly responsive to the examiner's comment on page 3, lines 12-13 that applicants' claim language does not preclude the existence of an amine oxide.

By incorporating claim 5 into claim 1 the rejection stated in item 4 of the Official Action is overcome as claim 5 is not included in that rejection. This leaves for consideration the rejection of claim 5 (only), item 6 of the Official Action. In analyzing this rejection it is appropriate to review practices in this art as evidenced by applicants' specification and amended claims and contrasted with the primary reference applied in the outstanding Official Action.

In preparing an electret non-woven fabric it is necessary to apply an oil as a sizing agent to the surface of a staple fiber when the staple fiber is produced, in order to prevent loosening of filaments of the produced staple fiber. When the thus-obtained staple fiber is used for producing an electret non-woven fabric, it is necessary to remove the oil from the staple fiber. Otherwise, it is impossible to treat the staple fiber for electrically charging the same. The reason for this is as follows. Oil is a kind of a surfactant and has hydrophilic groups and hydrophobic groups. The hydrophilic groups release electrostatic

charges from the staple fiber surface, and the electrically charging treatment can be no longer effected (see applicants' specification, page 1, lines 28-35).

As further evidence for the above, the cited Dahringer et al reference discloses that the amine oxide $R_1R_2R_3NO$ used as an oil in the production of staple fibers is volatilized or thermally decomposed by heat treatment prior to the production of electric fibers, so that it is removed (column 3, lines 50-52).

In contrast, the ester of polyethylene glycol and a fatty acid ("PEG-FA ester" hereinafter) used as an oil in the amended claim 1 is neither volatilized nor thermally decomposed by heat treatment. However, the hydrophilic groups infiltrate the fiber and the hydrophobic groups alone are present on the fiber surface (see applicants' specification, page 5, lines 17-21), as is discussed in the previous Amendment of February 25, 2004.

The hydrophilic groups of the oil infiltrate the fiber and do not exist on the fiber surface, so that the hydrophilic groups are not present on the fiber surface thus cannot inhibit the electrically charging treatment. Therefore, the staple fiber having PEG-FA ester adhering thereto as an oil, specified in the amended claim 1, permits a smooth electrically charging treatment thereof and provides an electret non-woven fiber.

The amended claim 1 specifies that "a polyolefin heat-bonding fiber having 0.05 to 1% by weight of an oil adhering thereto ... the amount of the adhering oil decreases 0.001 to 0.2% by weight". However, this does not mean that the oil, PEG-FA ester, is volatilized or thermally decomposed by heating – it means the following: The hydrophilic groups of the PEG-FA infiltrate the fiber, so that the oil is not extracted from a non-woven fabric sample by an extraction method using an ethyl alcohol/methyl alcohol mixture solvent, described in the present specification, page 5, lines 28 to 35, and as a result, the amount of the adhering oil found by the measurement decreases.

To summarize, the PEG-FA ester in the amended claim 1 enables the production of an electret non-woven fabric from a staple fiber on the basis of a function and mechanism completely different from those of the amine oxide used by Dahringer et al.

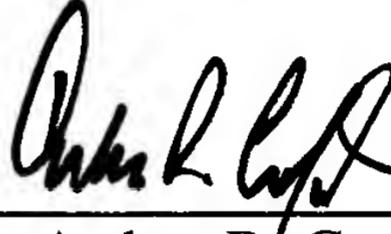
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That is, hydrophilic groups of the PEG-FA infiltrate into the staple fiber. The amended claim 1 is therefore unobvious over Dahringer et al.

For the above reasons it is respectfully submitted that this Amendment places claim 1 and the claims dependent from it, in condition for allowance. Reconsideration and favorable action are solicited.

Respectfully submitted,

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